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(54) Indicator for a passenger conveying device.

(57) An electronic indicating device (24) is disposed on the outer deck profile (20) of a passenger conveying device (10). The indicating device includes a display (52) capable of displaying a symbol indicative of direction of operation and stopped operation of the passenger conveying device. The indicating device comprises a post (30) attached at a lower end thereof to the outer deck (20) and having a display housing (42) attached at angle (α) at an upper end of the post. The electronic display is disposed in the display housing. A base (26) is disposed on the outer deck with the post passing through an opening in the base. A transparent enclosure (44) having upper and lower openings is disposed over the base, the post, and the display housing, with the display disposed within the upper opening of the enclosure. A logic circuit (64) interfaces with the passenger conveying device and the display to determine the symbol indicative of the operational feature of the passenger conveying device to be displayed.

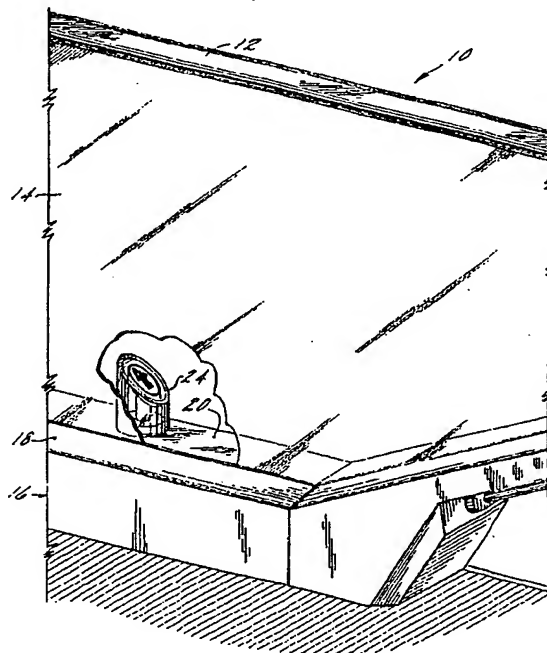


FIG. 1

EP 0 676 363 A2

This invention relates to an indicator for a passenger conveying device. More specifically, this invention relates to an indicator advantageously positioned relative to a balustrade of a passenger conveying device, such as a moving stairway or a moving walkway.

Escalators, moving walkways, and other people moving devices efficiently move a large volume of pedestrian traffic from one point to another. Passengers step on moving steps (or belts, or pallets) and are transported along the length of the device from a first landing to a second landing at a constant rate of speed.

It is known in the art that escalators and other passenger conveying devices may convey passengers from the first landing to the second landing, or vice versa. This is particularly true in public transportation settings where a plurality of escalators are positioned side by side. During a morning rush hour, for example, passenger traffic may flow best if a majority of the escalators are directed to convey passengers towards the public transportation. During the evening rush hour the opposite may be true; traffic may flow best if the majority of escalators are directed away from the public transportation. In any case, a person of skill will recognise that there is a need to inform passengers of the escalator's direction if it is subject to change.

Directional indicators are known for public transportation escalators found in airports, subway stations, train stations, and the like. Typically they are mounted on stations independently positioned a distance away from the landing of the escalator. Because of space and aesthetic constraints, directional indicators mounted on stations are typically not used in indoor settings such as office buildings and department stores.

A directional indicator device for escalators is shown in U.S. Patent No. 4,798,274, wherein an illumination device is mounted on the outside surface of a transparent balustrade panel for illuminating the landing of the escalator. A decorative member or cover is mounted on the inside surface of the transparent balustrade panel to cover the back side of the illumination device. The decorative member has a mirror surface to enable persons approaching the escalator to view the landing area. This decorative member further has an arrow thereon for indicating the running direction of an escalator.

In accordance with one aspect of the present invention, an indicator having a display is disposed on the balustrade outer decking of a passenger conveying device. The indicator is electrically connected to the passenger conveying device with the display indicating non-operating or direction of operation conditions of the passenger conveying device.

The present invention may provide an indicator for a passenger conveying device which is positioned in an aesthetically pleasing manner, whereby the in-

dicator would be acceptable for use in department stores and the like. Use of this indicator may result in safer operation of the passenger conveyor device. Approaching passengers will now be informed as to which way an escalator or walkway is travelling, or that an escalator or walkway is stationary, and which way a stationary escalator or walkway may begin to travel.

An embodiment of the invention will now be described by way of example and with reference to the accompanying drawings, in which:-

FIG. 1 is a perspective view showing a portion of an escalator around a landing area with the escalator employing an indicator mounted on the outer decking in accordance with the present invention; FIG. 2 is a side elevation view of the indicator shown in FIG. 1;

FIG. 3 is a front view of the indicator shown in FIG. 1;

FIG. 4 is a diagrammatic view of a display of the indicator of FIG. 1; and

FIG. 5 is a schematic block diagram of the electronics of the indicator of FIG. 1.

Referring now to FIG. 1, a portion of an escalator around a landing area is shown generally at 10. The escalator 10 comprises a plurality of steps (not shown) connected together in an endless loop circulating between upper and lower landings. A balustrade assembly comprising a base 16, a plurality of balustrade panels 14, and a handrail 12 is positioned on each side of the moving steps as is known in the art. The balustrade panels 14 extend up from the base 16 to support the handrail 12 which travels in the same direction as the moving steps. The base 16 includes an inner decking 18 and an outer decking 20. The balustrade panels 14 may comprise glass or any other suitable transparent material, e.g. a transparent plastic.

An indicator device 24 is disposed on the outer decking 20 in the general proximity of the landing area of the escalator 10. The indicator device 24 is positioned for ease of viewing by persons approaching the escalator 10. While the description herein is directed to an escalator, it will be appreciated that any passenger conveyor device may employ the present invention (e.g. a moving walkway).

Referring to FIGS. 2 and 3, the indicator device 24 comprises a cylindrical base 26 having an opening 28 therethrough at about the center thereof. A post 30 is attached at the lower end 31 thereof to the outer decking 20 by fastener 32. In this example, the lower end 31 of the post 30 is threaded and a nut 36 and washer are used to attach the post 30 to the outer decking 20. An upper end 38 of the post 30 is cut at an angle α defined by the intersection of a plane A in which the upper end 38 lies and a plane B parallel with an upper surface 40 of the outer decking 20, this angle α being about 40°. A display housing 42 is mount-

ed at the upper end 38 of the post 30 such that the upper surface of the display housing 42 is also disposed at angle α . A transparent cylindrical enclosure 44 is disposed over the display housing 42, the post 30 and the base 26. The transparent enclosure 44 has an opening 46 at its lower end, with the inner diameter of this opening closely matching the outer diameter of the base 26 disposed therein. The transparent enclosure 44 may be comprised of glass or any other suitable transparent material, e.g. a transparent plastic. Further, the enclosure may also be comprised of other than a transparent material, e.g., aluminum with a brushed finish or a reflective material. A shoulder 48 is defined near the lower end of the enclosure 44, with the shoulder 48 disposed on the upper surface of the base 26 about the circumference thereof. The upper end of the enclosure 44 is cut such that the upper surface of the enclosure 44 is also disposed at angle α . The upper end of the enclosure 44 has an opening 50, with the inner diameter of this opening closely matching the outer diameter of the display housing 42 disposed therein. It will be appreciated that while the indicator device 24 has been described above as having a generally cylindrical shape, other shapes will suffice, e.g. polygonal.

The display housing 24 houses a display 52 capable of displaying a desired symbol. The display 52 comprises an array or matrix of light emitting diodes (LEDs) 54, diagrammatically shown in FIG. 4. The LEDs 54 are preferably triple color LEDs (i.e., green, red and blue LEDs, as such are well known); however, single or double color LEDs may be employed. Moreover, it is within the scope of the present invention that the display 52 comprise a liquid crystal display or any other electronic display capable of displaying a desired symbol. By way of example only, a stop or non-operating signal is shown in the display 52 in FIG. 3 and a directional signal is shown in the display 52 in FIG. 1. These particular signals may be used with intermittent operation passenger conveyor devices, but are not intended to be limited to such. Further, the desired color combination of the displayed symbol can be selected to fit the environment where the indicator is being used. It is within the scope of the present invention that different symbols, even moving signals, can be displayed, as such is dictated by the particular application.

Referring now to FIG. 5, a schematic block diagram of the electronics for the indicator 24 is shown. The electronics may be housed in the base 26 or in the display housing 24 with external connections to supply and command signals. A supply line 56 is connected to a power supply 58 which converts a.c. line power to d.c. voltage signals present on a line 60 for powering the LEDs 54 and present on a line 62 for powering a logic circuit 64. The logic circuit 64, in response to command signals from a line 66, generates display signals which are presented on a line 68 to the

LEDs 54, whereby the LEDs are activated to generate the requested signal. The logic circuit 64 may comprise a microprocessor or a programmable logic (e.g., PAL or GAL). The command signals and preferably the power signal originate from the escalator 10 itself, for example on wires passing through an opening in the outer decking 20 under the base 26.

Claims

1. A passenger conveying device comprising:
 - means for moving passengers;
 - a balustrade assembly disposed at a side of said means for moving passengers, said balustrade assembly comprising:
 - a base (16) having an inner decking (18) and an outer decking (20);
 - a balustrade panel (14) extending upwardly from said base, wherein said inner decking is positioned between said means for moving passengers and said balustrade panel, and said outer decking is positioned on a side of said balustrade panel opposite said means for moving passengers; and means (24) for indicating an operational mode of said passenger conveyor device, wherein said indicating means is disposed on said outer decking and comprises:
 - a post (30) attached at a lower end (31) thereof to said outer decking;
 - a housing (42) mounted at an upper end (38) of said post at an angle (α) relative to said outer decking; and
 - electronic display means (52) disposed in said housing for electronically displaying a symbol indicative of the operational mode of said passenger conveying device.
2. The passenger conveying device of claim 1 wherein said electronic display means (52) comprises:
 - an array of light emitting diodes (54) activatable to display the symbol indicative of the operational mode of said passenger conveying device.
3. The passenger conveying device of claim 1 or 2 wherein the operational mode of said passenger conveying device includes a direction of operation and a stopped operational condition.
4. The passenger conveying device of any of claims 1 to 3 wherein the said indicating means (24) further comprises:
 - an enclosure (44) having upper (50) and lower (46) openings, said enclosure being disposed over said post (30) and said housing (42) with said electronic display means (52) disposed

in said upper opening.

5. The passenger conveying device of claim 4 wherein said enclosure (44) is transparent.
6. The passenger conveying device of claim 4 or 5 wherein said enclosure (44) has a generally cylindrical shape.
7. The passenger conveying device of any preceding claim, wherein the said indicating means (24) further comprises:
 - a base (26) disposed on said outer decking (20), said base having an opening (28) through which said post (30) passes.
8. A passenger conveying device comprising:
 - means for moving passengers;
 - a balustrade assembly disposed at a side of said means for moving passengers, said balustrade assembly comprising:
 - a base (16) having a inner decking (18) and an outer decking (20);
 - a balustrade panel (14) extending upwardly from said base, wherein said inner decking is positioned between said means for moving passengers and said balustrade panel, and said outer decking is positioned on a side of said balustrade panel opposite said means for moving passengers;
 - means (24) for indicating an operational mode of said passenger conveyor device, wherein said indicating means is disposed on said outer decking and comprises electronic display means (52) for electronically displaying a symbol indicative of the operational mode of said passenger conveying device; and
 - logic circuit means (64) for interfacing with said passenger conveying device and said electronic display means to determine the symbol indicative of the operational mode of said passenger conveying device to be displayed, said logic circuit means activating said electronic display means to display said signal.
9. The passenger conveying device of claim 8, wherein said indicating means (24) comprises:
 - a post (30) attached at a lower end (31) thereof to said outer decking (20); and
 - a housing (42) mounted at an upper end (38) of said post at an angle (α) relative to said outer decking;
 - said electronic display means (52) being disposed in said housing.
10. An indicator (24) for a passenger conveying device, comprising:
 - a post (30) having means for attachment at

a lower end (31) thereof;

a housing (42) mounted at an upper end (38) of said post at a non-zero angle (α) relative to a central axis of said post; and

electronic display means (52) disposed in said housing for electronically displaying a symbol indicative of an operational mode of the passenger conveying device.

11. The indicator of claim 10 further comprising:
 - an enclosure (44) having upper (50) and lower (46) openings, said enclosure being disposed over said post (30) and said housing (42) with said electronic display means (52) disposed in said upper opening.
12. The indicator of claim 11 wherein said enclosure (44) is transparent.
13. The indicator of claim 11 or 12 wherein said enclosure (44) has a generally cylindrical shape.
14. The indicator of any of claims 10 to 13 further comprising:
 - a base (26) disposed on said post (30) near the lower end (31) thereof, said base having an opening (28) through which said post passes.
15. The indicator of any of claims 10 to 14 further comprising:
 - logic circuit means (64) for interfacing with the passenger conveying device and said electronic display means (52) to determine the symbol indicative of the operational feature of the passenger conveying device to be displayed, said logic circuit means activating said electronic display means to display said signal.
16. A passenger conveyor device comprising:
 - means for moving passengers;
 - a balustrade assembly disposed at a side of said means for moving passengers,
 - electronic indicating means (24) disposed near said balustrade assembly for indicating an operational mode of said passenger conveying device, said indicating means comprising electronic display means (52) for electronically displaying a symbol indicative of the operational feature of said passenger conveyor device; and
 - logic circuit means (64) for interfacing with said passenger conveying device and said electronic display means to determine the symbol indicative of the operational feature of said passenger conveying device to be displayed, said logic circuit means activating said electronic display means to display said signal.
17. The passenger conveying device of claim 16

wherein said electronic display means (52) comprises:

an array of light emitting diodes (54) activatable to display the symbol indicative of the operational mode of said passenger conveying device.

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18. The passenger conveying device of claim 16 or 17 wherein the said operational mode of said passenger conveying device includes a direction of operation and a stopped operational condition.

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19. The passenger conveying device of any of claims 16 to 18, wherein said electronic indicating means (24) further comprises:

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a post (30) having means for attachment at a lower end (31) thereof;

a housing (42) mounted at an upper end (38) of said post at a non-zero angle (α) relative to a central axis of said post; and

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said electronic display means (52) being disposed in said housing.

20. A passenger conveyor device comprising:

means for moving passengers;

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a balustrade assembly disposed at a side of said means for moving passengers, and electronic indicating means (24) disposed near said balustrade assembly for indicating an operational mode of said passenger conveying device, said electronic indicating means comprising:

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a post (30) having means for attachment at a lower end (31) thereof;

a housing (42) mounted at an upper end (38) of said post at a non-zero angle (α) relative to a central axis of said post; and

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electronic display means (52) disposed in said housing for electronically displacing a symbol indicative of an operational mode of the passenger conveying device.

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21. Apparatus according to any preceding claim, wherein said passenger conveying device is an escalator.

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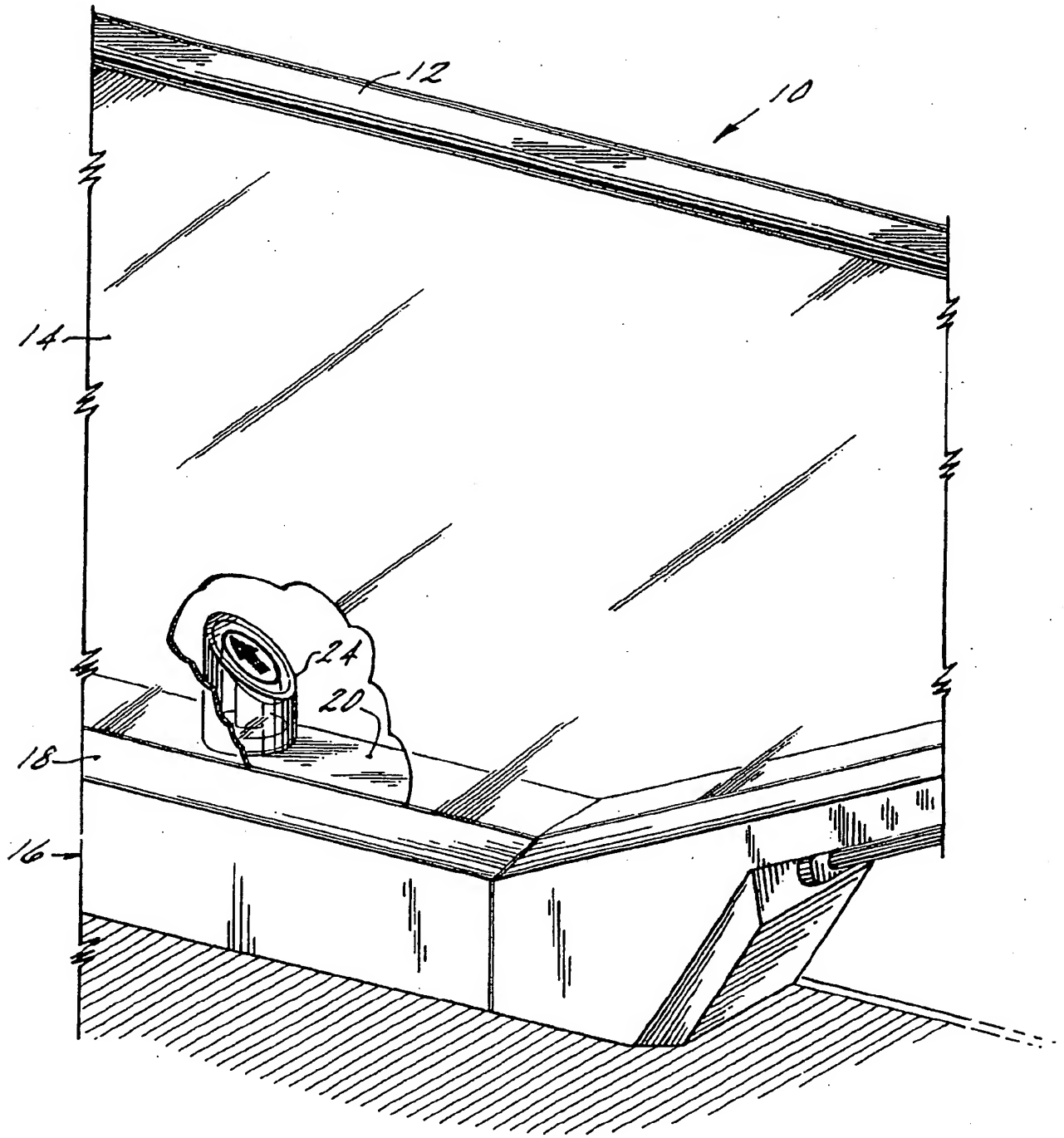


FIG. 1

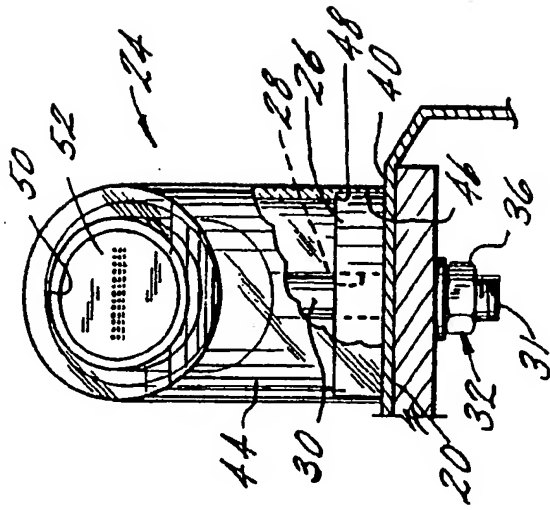
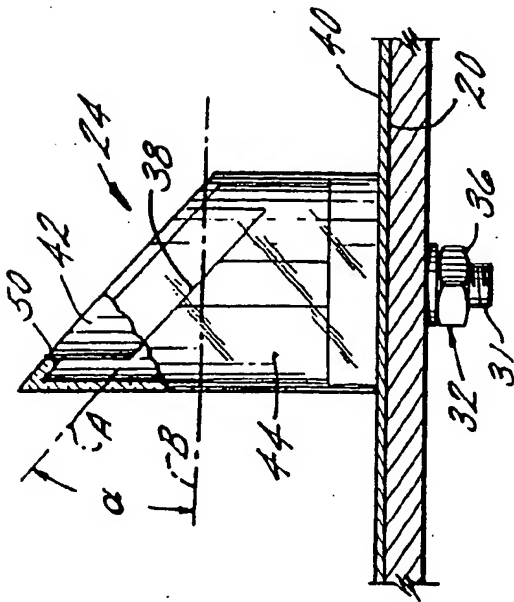
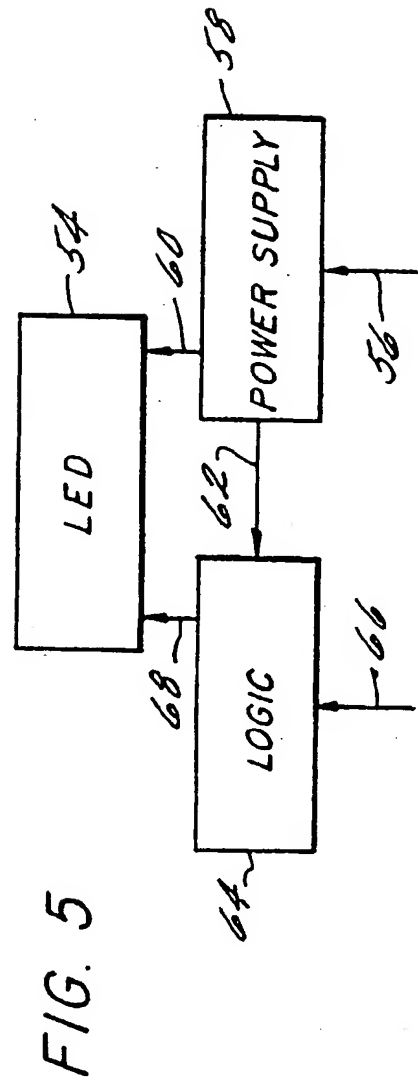


FIG. 2

FIG. 3



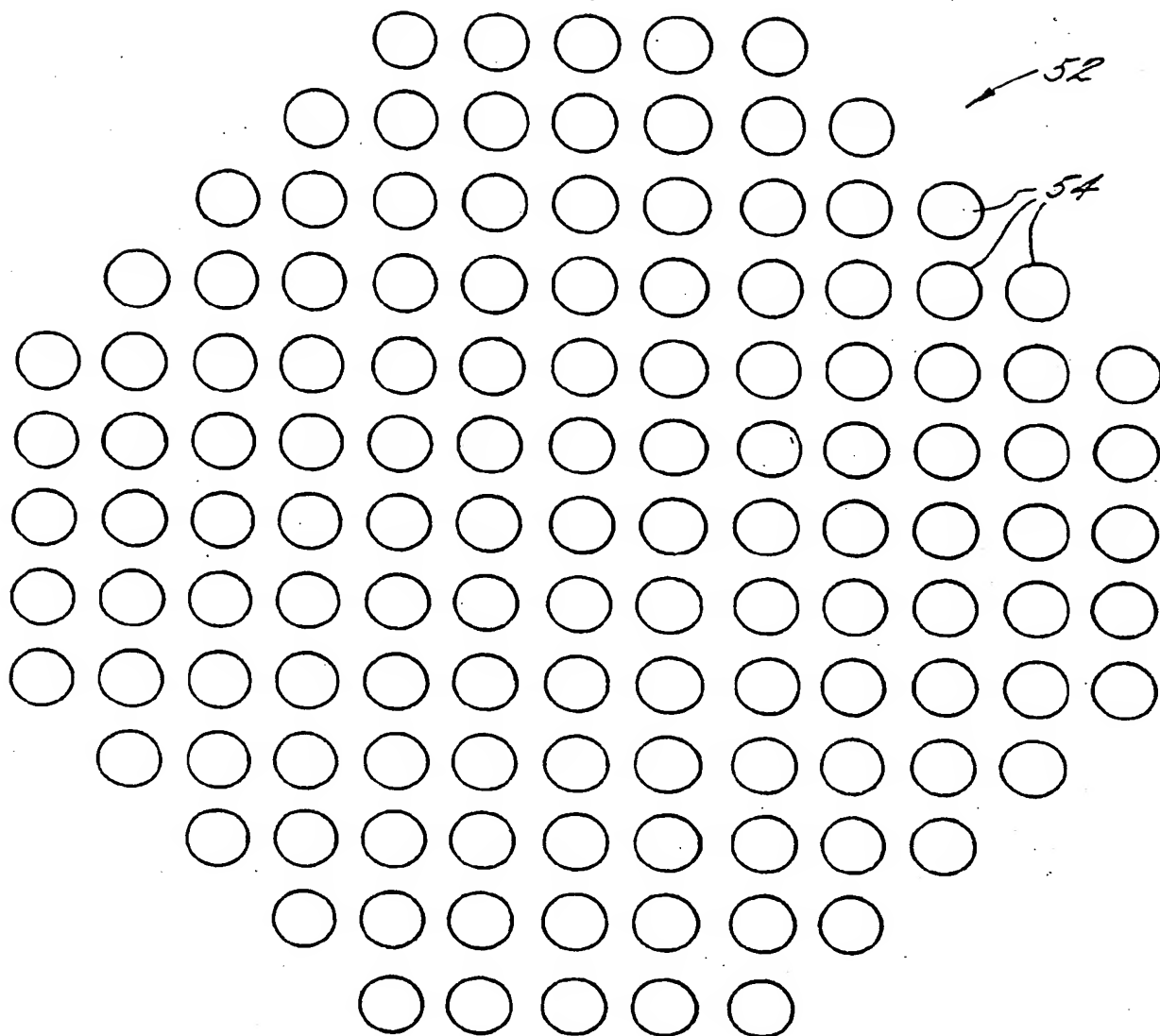


FIG. 4

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